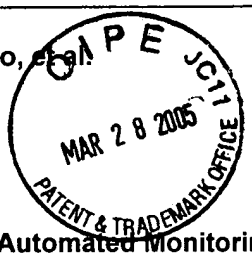
TRANSMITTAL FORM	Attorney Docket No. BC9-99-047/1455P



In re the application **Brunheroto, et al.**

Confirmation No: **9149**

Serial No: **09/602,278**

Group Art Unit: **2611**

Filed: **June 23, 2000**

Examiner: **Saltarelli, Dominic D.**

For: **Method and System for Automated Monitoring of Quality of Service of Digital Video Material Distribution and Play-Out**

ENCLOSURES *(check all that apply)*					
☐	Amendment/Reply	☐	Assignment and Recordation Cover Sheet	☐	After Allowance Communication to Group
	☐ After Final	☐	Part B-Issue Fee Transmittal	☐	Notice of Appeal
☐	Information disclosure statement	☐	Letter to Draftsman	■	Appeal Brief (Corrected)
	☐ Form 1449	☐	Drawings	☐	Status Letter
	☐ (X) Copies of References	☐	Petition	■	Postcard
☐	Extension of Time Request *	☐	Fee Address Indication Form	☐	Other Enclosure(s) (*please identify below):*
☐	Express Abandonment	☐	Terminal Disclaimer		
☐	Certified Copy of Priority Doc	☐	Power of Attorney and Revocation of Prior Powers		
■	Response to Notice of Non-Compliant Appeal Brief	☐	Change of Correspondence Address		
☐	Response to Missing Parts	*Extension of Term: Pursuant to 37 CFR 1.136, Applicant petitions the Commissioner to extend the time for response for xxxxxx month(s), from to .			
	☐ Executed Declaration by Inventor(s)				

CLAIMS					
FOR	Claims Remaining After Amendment	Highest # of Claims Previously Paid For	Extra Claims	RATE	FEE
Total Claims	0	0	0	$ 50.00	$ 0.00
Independent Claims	0	0	0	$200.00	$ 0.00
				Total Fees	$ 0.00

METHOD OF PAYMENT	
☐	Check no. _____ in the amount of $ _____ is enclosed for payment of fees.
■	Charge any fees or credit any overpayment to Deposit Account No. 02-2120 (Sawyer Law Group LLP)

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT	
Attorney Name	Stephen G. Sullivan, Reg. No. 38,329
Signature	
Date	March 24, 2005

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop Appeal Brief-Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on March 24, 2005

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Signature	

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Irena Nikolova

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In Re Application of:

BRUNHEROTO, et al.

Serial No.: 09/602,278

Filed: June 23, 2000

Date: March 24, 2005

Confirmation No.: 9149

Group Art Unit: 2611

Examiner: Saltarelli, D.

For: METHOD AND SYSTEM FOR AUTOMATED MONITORING OF QUALITY OF SERVICE OF DIGITAL VIDEO MATERIAL DISTRIBUTION AND PLAY-OUT

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE TO NOTIFICATION OF NON-COMPLIANTAPPEAL BRIEF

Sir:

In response to the Notification of Non-Compliant Appeal Brief dated February 24, 2005, submitted herewith is the corrected Appeal Brief.

The Commissioner is hereby authorized to charge any fees or credit any overpayment associated with this communication to Deposit Account 02-2120. If any unresolved issues remain, please contact Applicant's attorney at the telephone number indicated below.

Respectfully submitted,

SAWYER LAW GROUP LLP

March 24, 2005
Date

Stephen G. Sullivan
Attorney for Applicant(s)
Reg. No. 38,329
(650) 493-4540

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

APPEAL NO:

In Re Application of: BRUNHEROTO, et al.

Confirmation No. 9149

Serial No. 09/602,278

Filed: June 23, 2000

For: METHOD AND SYSTEM FOR AUTOMATED MONITORING OF QUALITY OF SERVICE OF DIGITAL VIDEO MATERIAL DISTRIBUTION AND PLAY-OUT

APPEAL BRIEF

TOPICAL INDEX

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In Re Application of:	Date: March 24, 2005
BRUNHEROTO, et al.	Confirmation No. 9149
Serial No. 09/602,278	Group Art Unit: 2611
Filed: June 23, 2000	Examiner: Saltarelli, Dominic

For: METHOD AND SYSTEM FOR AUTOMATED MONITORING OF QUALITY OF SERVICE OF DIGITAL VIDEO MATERIAL DISTRIBUTION AND PLAY-OUT

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P. O. Box 1450
Alexandria, VA 22313-1450

APPELLANT'S BRIEF ON APPEAL

Sir:

Appellant herein files an Appeal Brief drafted in accordance with the provisions of 37 C.F.R. § 1.192(c) as follows:

I. REAL PARTY IN INTEREST

Appellant respectfully submits that the above-captioned application is assigned, in its entirety to International Business Machines Corporation, Armonk, New York.

II. RELATED APPEALS AND INTERFERENCES

Appellant states that, upon information and belief, he is not aware of any co-pending appeal or interference which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Application Serial No. 09/602,278 (the instant application) as originally filed included claims 1-29. Claims 2-24 and 26-29 are pending. In response to the Office Action with a mailing date of 1/16/04 (paper no. 3), claims 1 and 25 were canceled and claims 2, 12, 13, 18, 26, and 27 were amended. Claim 18 was amended in accordance with the Examiner's suggestion to overcome a 35 U.S.C. 112, second paragraph, rejection. Claims 2 and 26 were amended to be of independent form, while independent claim 13 was amended to include the aspect of the hashing algorithm in correspondence with claim 2. Claims 12 and 27 were amended to maintain dependency on a pending claim. Claims 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 26, 27, 28, and 29 are on appeal and all applied prospective rejections concerning Claims 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 26, 27, 28, and 29 are being appealed herein.

IV. STATUS OF AMENDMENT

All amendments made to the instant application were entered.

V. SUMMARY OF CLAIMED SUBJECT MATTER

The present invention provides aspects for automated monitoring of quality of service of digital video material being distributed and played. Independent claim 2 recites a method for automated monitoring of quality of service of digital video material being distributed and played that includes embedding a signature in each frame of the digital video material by a program source device control by utilizing a hashing algorithm to produce the signature for each frame in the digital video material during encoding of the digital video material. See page 3, line 2 through page 5, line 2. The method further includes computing play-out statistics for the digital video material based on the signature by a program play-out device control. See page 5, line 7.

Independent claim 13 recites a system for automated monitoring of quality of service of digital video material being distributed and played that includes a program source 10 (FIG. 1) of viewing program data, the program source embedding a signature in each frame of digital video material within the viewing program data by utilizing a hashing algorithm to produce the signature for each frame in the digital video material during encoding of the digital video material. See page 3, line 2 through page 5, line 2. Further included is a play-out device 20 (FIG. 1) for receiving the viewing program data and computing play-out statistics for the digital video material based on the signature, (see page 5, line 21) and a display device 30 (FIG. 1) coupled to the play-out device for displaying video output of the viewing program data from the play-out device.

Independent claim 26 recites another method aspect. The method includes embedding video source material at a program source with hidden data and a meta-stream 100 (FIG. 2) for uniquely marking a digital advertisement with the video source material, wherein the hidden data

further comprises a signature generated by a hashing algorithm for each frame of the digital advertisement. See page 3, line 22 and page 4, line 13. The meta-stream and the digital advertisement are isolated from the video source material in a program play-out device 110 (FIG. 2). See page 4, line 20 and page 5, line 15. The meta-stream is utilized in the program play-out device to determine play-out statistics for the digital advertisement 120 (FIG. 2). See page 5, line 21.

Through the present invention, determining statistics on a particular video program occurs in a manner that avoids intensive manual human monitoring and provides a more efficient and automatic ability to achieve quality of service measurements. The present invention utilizes technology to embed hidden data into a video or associate data with the video file, and provides the ability to take correlated hidden data and video images together that an application can then process to do applications such as billing, quality of service measurements, rights management, and external device control.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 2, 12-16, 19-24, and 26-29 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Copriviza et al ("Copriviza") in view of Echeita et al ("Echeita") and further in view of Iggulden.

Claim 3 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Copriviza in view of Echeita and Iggulden and further in view of Linnartz.

Claims 4-11 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Copriviza, Echeita, and Iggulden and further in view of Goodman et al ("Goodman").

Claim 17 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Copriviza, Echeita, and Iggulden and further in view of Caporizzo.

Claim 18 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Copriviza, Echeita, and Iggulden and further in view of Goodman.

VII. ARGUMENT

A. Rejection under 35 U.S.C. 103(a) over Copriviza in view of Echeita and further in view of Iggulden

Claims 2, 12-16, 19-24, and 26-29

In the present invention, automated monitoring of quality of service of digital video material being distributed and played occurs. The automated monitoring includes embedding a signature in each frame of the digital video material by a program source device control with computation of play-out statistics for the digital video material based on the signature by a program play-out device control. The present invention also includes utilizing a hashing algorithm to produce the signature for each frame in the digital video material during encoding of the digital video material.

In making the rejection, the Examiner cites Copriviza for disclosing the recited embedding of a signature in each frame of video material and computing play-out statistics based on the signature but admits that Copriviza fails to disclose that the video material is digital. Echeita is cited for teaching a method for monitoring quality of service of digital video for combination with Copriviza. Both Copriviza and Echieta are admitted by the Examiner as failing to disclose utilizing a hashing algorithm to produce the signature. Thus, the Examiner cites Iggulden for combination with Copriviza and Echeita, and states, "Iggulden discloses

utilizing a hashing algorithm to produce a signature for each frame in a video material (col. 6, lines 25-36), allowing the material to be quickly identified in real time."

In the cited section of col. 6, lines 25-36 of Iggulden, Iggulden merely mentions that a signature being detected from a segment of a television broadcast "may, for example, be a binary hash code." Appellant respectfully submits that Iggulden fails to teach, show, or suggest that a hashing algorithm is utilized to produce the signature for each frame in the digital video material and/or during encoding of the digital video material, as recited in the independent claims. Referring to Figures 8, 9, 10, and 11 of Iggulden and their discussion (col. 15, line 29+), the 'signature' is Iggulden is taught as being 'read' after receipt of the television broadcast signal and upon detection of an event marker in the television signal. The 'reading' of the signature actually involves producing a bit string based on luminance levels of selected lines from a single test frame of the received data.

Thus, the signature is formed after receipt of the test frame during broadcast, and not as a part of any type of encoding. In contrast, utilization of the hashing algorithm to produce the signature in Appellant's recited invention occurs by a program source during encoding. Further, while Iggulden utilizes a single test frame to produce a signature for the received signal, Appellant fails to see any teaching or suggestion that each frame has a signature that is generated utilizing a hashing algorithm, as recited in Appellant's invention. Therefore, Appellant respectfully submits that by not including a signature produced with a hashing algorithm in every frame, and by not producing the signature with a hashing algorithm during the encoding of the video material, Iggulden fails to teach or suggest the recited hashing algorithm used to generate a signature in every frame of digital video material.

Additionally, Iggulden does not teach or suggest that a hash code signature is needed for digital television signals. Rather, Iggulden states that "if the television signal is digital, ... the signature is simply based on selected bits within one or more selected digital frames." (col. 19, lines 12-14) Thus, there is nothing from Iggulden to teach or suggest that digital video material utilizes a signature in every frame produced with a hash code algorithm during encoding of the digital video material.

In response, the Examiner states:

> **[A]pplicant argues that Iggulden fails to teach or suggest using a hashing algorithm to produce a signature in each frame. It is Copriviza who teaches adding a signature to each frame (col. 8, lines 26-39). Iggulden teaches generating signatures using hash codes, which has the inherent and well known benefit of high speed locating of representative data objects when hash codes are used. It is the combination of Copriviza and Iggulden which meets the limitation of using a hashing algorithm to produce a signature in each frame.**

Appellant respectfully disagrees that the combination of Copriviza and Iggulden meets the limitation of using a hashing algorithm to produce a signature in each frame.

In addition to the deficiencies of Iggulden, Copriviza discloses in col. 8, lines 26-40, the encoding of a video tape of program material with a "predetermined unique and non-repeating sequence" as a means of individually and uniquely identifying each and every frame of the video program material. Copriviza further discloses in col. 15, lines 50-64, that in a

> **preferred embodiment each frame is numbered successively. ... It will be appreciated that the consecutive frame numbering system ... is merely one of many sequential frame number systems that may be used to identify each and every frame individually and uniquely. For example, succeeding frames in the program may be numbered in any predetermined sequence as long as the decoders in the field receivers 36 are programmed to recognize this sequence as being the normal sequence of a program which is received without interruption.**

Copriviza clearly uses a numbering sequence in order to provide the unique identification of successive frames. As such, while the number in each frame will vary, it has context relative

to preceding and successive frames based on the numbering sequence used. It is this context that is utilized in Copriviza to determine whether a frame sequence discontinuity (FSD) packet needs to be generated: (col. 15, lines 44-49) "An FSD packet is generated ... when successive frames are not in the proper sequence in which data is encoded..." Thus, without such use of a numbering sequence to provide context, the manner of producing the FSD packets is compromised, and the system of Copriviza is fundamentally altered.

The Examiner asserts in the Advisory Action dated 10/6/04 that "Copriviza clearly teaches adding signature information which uniquely identifies each individual frame of video, but does no [sic] rely exclusively on a numbering sequence for said identification, thus the inclusion of a hashing function to generate said information is a rational and feasible option." Appellant respectfully disagrees. In fact, in each of the quotes from Copriviza included by the Examiner in the Advisory Action, there is reference by Copriviza to a "predetemined unique and non-repeating sequence", that "each encoded frame is numbered successively", and that "the consecutive frame numbering system ... is merely one of many sequential number systems that may be used to identify each and every frame individually and uniquely." As demonstrated by these quotes, Copriviza clearly teaches that unique and individual frame identification occurs by using a sequential number system.

Appellant fails to see how the use of a sequential number system to identify successive frames in a program from Copriviza can be combined with the disclosure of a hash code signature utilizing a single test frame in Iggulden, since there is nothing to teach or suggest that a hash code signature from a single test frame could or would be used to provide a predetermined unique and non-repeating sequence (i.e., a sequential number system), as required by the identifier signature of every frame in Copriviza.

Accordingly, Appellant respectfully submits that Copriviza in view of Echeita, and further in view of Iggulden fails teach, show, or suggest use of a hashing algorithm to produce the signature for each frame in the digital video material and/or during encoding of the digital video material, as recited by the Appellant.

In view of the foregoing, Appellant respectfully submits that claims 2, 12-16, 19-24, and 26-29 are not taught, shown, or suggested by the cited art.

Accordingly, Appellant respectfully requests withdrawal of the rejection under 35 U.S.C. 103(a) and respectfully requests that the Board reverse the final rejection of Claims 2, 12-16, 19-24, and 26-29.

B. Rejection of Claim 3 under 35 U.S.C. 103(a) over Copriviza in view of Echeita and Iggulden and further in view of Linnartz

In the present invention, automated monitoring of quality of service of digital video material being distributed and played occurs. The automated monitoring includes embedding a signature in each frame of the digital video material by a program source device control with computation of play-out statistics for the digital video material based on the signature by a program play-out device control. The present invention also includes utilizing a hashing algorithm to produce the signature for each frame in the digital video material during encoding of the digital video material and providing a key identifier in a header of the signature and identifying inclusion of the signature based on the key identifier.

In making the rejection, the Examiner cites Copriviza for disclosing the recited embedding of a signature in each frame of video material and computing play-out statistics based on the signature but admits that Copriviza fails to disclose that the video material is

digital. Echeita is cited for teaching a method for monitoring quality of service of digital video for combination with Copriviza. Both Copriviza and Echieta are admitted by the Examiner as failing to disclose utilizing a hashing algorithm to produce the signature. Thus, the Examiner cites Iggulden for combination with Copriviza and Echeita, and states, "Iggulden discloses utilizing a hashing algorithm to produce a signature for each frame in a video material (col. 6, lines 25-36), allowing the material to be quickly identified in real time."

In the cited section of col. 6, lines 25-36 of Iggulden, Iggulden merely mentions that a signature being detected from a segment of a television broadcast "may, for example, be a binary hash code." Appellant respectfully submits that Iggulden fails to teach, show, or suggest that a hashing algorithm is utilized to produce the signature for each frame in the digital video material and/or during encoding of the digital video material, as recited in the independent claims. Referring to Figures 8, 9, 10, and 11 of Iggulden and their discussion (col. 15, line 29+), the 'signature' is Iggulden is taught as being 'read' after receipt of the television broadcast signal and upon detection of an event marker in the television signal. The 'reading' of the signature actually involves producing a bit string based on luminance levels of selected lines from a single test frame of the received data.

Thus, the signature is formed after receipt of the test frame during broadcast, and not as a part of any type of encoding. In contrast, utilization of the hashing algorithm to produce the signature in Appellant's recited invention occurs by a program source during encoding. Further, while Iggulden utilizes a single test frame to produce a signature for the received signal, Appellant fails to see any teaching or suggestion that each frame has a signature that is generated utilizing a hashing algorithm, as recited in Appellant's invention. Therefore, Appellant respectfully submits that by not including a signature produced with a hashing

algorithm in every frame, and by not producing the signature with a hashing algorithm during the encoding of the video material, Iggulden fails to teach or suggest the recited hashing algorithm used to generate a signature in every frame of digital video material.

Additionally, Iggulden does not teach or suggest that a hash code signature is needed for digital television signals. Rather, Iggulden states that "if the television signal is digital, ... the signature is simply based on selected bits within one or more selected digital frames." (col. 19, lines 12-14) Thus, there is nothing from Iggulden to teach or suggest that digital video material utilizes a signature in every frame produced with a hash code algorithm during encoding of the digital video material.

In response, the Examiner states:

> **[A]pplicant argues that Iggulden fails to teach or suggest using a hashing algorithm to produce a signature in each frame. It is Copriviza who teaches adding a signature to each frame (col. 8, lines 26-39). Iggulden teaches generating signatures using hash codes, which has the inherent and well known benefit of high speed locating of representative data objects when hash codes are used. It is the combination of Copriviza and Iggulden which meets the limitation of using a hashing algorithm to produce a signature in each frame.**

Appellant respectfully disagrees that the combination of Copriviza and Iggulden meets the limitation of using a hashing algorithm to produce a signature in each frame.

In addition to the deficiencies of Iggulden, Copriviza discloses in col. 8, lines 26-40, the encoding of a video tape of program material with a "predetermined unique and non-repeating sequence" as a means of individually and uniquely identifying each and every frame of the video program material. Copriviza further discloses in col. 15, lines 50-64, that in a

> **preferred embodiment each frame is numbered successively. ... It will be appreciated that the consecutive frame numbering system ... is merely one of many sequential frame number systems that may be used to identify each and every frame individually and uniquely. For example, succeeding frames in the program may be numbered in any predetermined sequence as long as the decoders in the field receivers 36 are programmed to recognize**

this sequence as being the normal sequence of a program which is received without interruption.

Copriviza clearly uses a numbering sequence in order to provide the unique identification of successive frames. As such, while the number in each frame will vary, it has context relative to preceding and successive frames based on the numbering sequence used. It is this context that is utilized in Copriviza to determine whether a frame sequence discontinuity (FSD) packet needs to be generated: (col. 15, lines 44-49) "An FSD packet is generated ... when successive frames are not in the proper sequence in which data is encoded..." Thus, without such use of a numbering sequence to provide context, the manner of producing the FSD packets is compromised, and the system of Copriviza is fundamentally altered.

The Examiner asserts in the Advisory Action dated 10/6/04 that "Copriviza clearly teaches adding signature information which uniquely identifies each individual frame of video, but does no [sic] rely exclusively on a numbering sequence for said identification, thus the inclusion of a hashing function to generate said information is a rational and feasible option." Appellant respectfully disagrees. In fact, in each of the quotes from Copriviza included by the Examiner in the Advisory Action, there is reference by Copriviza to a "predetemined unique and non-repeating sequence", that "each encoded frame is numbered successively", and that "the consecutive frame numbering system ... is merely one of many sequential number systems that may be used to identify each and every frame individually and uniquely." As demonstrated by these quotes, Copriviza clearly teaches that unique and individual frame identification occurs by using a sequential number system.

Appellant fails to see how the use of a sequential number system to identify successive frames in a program from Copriviza can be combined with the disclosure of a hash code signature utilizing a single test frame in Iggulden, since there is nothing to teach or suggest

that a hash code signature from a single test frame could or would be used to provide a predetermined unique and non-repeating sequence (i.e., a sequential number system), as required by the identifier signature of every frame in Copriviza.

Accordingly, Appellant respectfully submits that Copriviza in view of Echeita, and further in view of Iggulden fails teach, show, or suggest use of a hashing algorithm to produce the signature for each frame in the digital video material and/or during encoding of the digital video material, as recited by the Appellant.

In addition, Appellant respectfully submits that even the inclusion of Linnartz is insufficient to overcome the deficiencies of Copriviza in view of Echeita and further in view of Iggulden. Therefore, Appellant respectfully requests withdrawal of the rejection against claim 3.

In view of the foregoing, Appellant respectfully submits that claim 3 is not taught, shown, or suggested by the cited art.

Accordingly, Appellant respectfully requests withdrawal of the rejection under 35 U.S.C. 103(a) and respectfully requests that the Board reverse the final rejection of Claim 3.

C. Rejection under 35 U.S.C. 103(a) over Copriviza in view of Echeita and Iggulden and further in view of Goodman

Claim 4-11

In the present invention, automated monitoring of quality of service of digital video material being distributed and played occurs. The automated monitoring includes embedding a signature in each frame of the digital video material by a program source device control with computation of play-out statistics for the digital video material based on the signature by a

program play-out device control and creating a meta-stream for the digital video material and encrypting the meta-stream. The present invention also includes utilizing a hashing algorithm to produce the signature for each frame in the digital video material during encoding of the digital video material.

In making the rejection, the Examiner cites Copriviza for disclosing the recited embedding of a signature in each frame of video material and computing play-out statistics based on the signature but admits that Copriviza fails to disclose that the video material is digital. Echeita is cited for teaching a method for monitoring quality of service of digital video for combination with Copriviza. Both Copriviza and Echieta are admitted by the Examiner as failing to disclose utilizing a hashing algorithm to produce the signature. Thus, the Examiner cites Iggulden for combination with Copriviza and Echeita, and states, "Iggulden discloses utilizing a hashing algorithm to produce a signature for each frame in a video material (col. 6, lines 25-36), allowing the material to be quickly identified in real time."

In the cited section of col. 6, lines 25-36 of Iggulden, Iggulden merely mentions that a signature being detected from a segment of a television broadcast "may, for example, be a binary hash code." Appellant respectfully submits that Iggulden fails to teach, show, or suggest that a hashing algorithm is utilized to produce the signature for each frame in the digital video material and/or during encoding of the digital video material, as recited in the independent claims. Referring to Figures 8, 9, 10, and 11 of Iggulden and their discussion (col. 15, line 29+), the 'signature' is Iggulden is taught as being 'read' after receipt of the television broadcast signal and upon detection of an event marker in the television signal. The 'reading' of the signature actually involves producing a bit string based on luminance levels of selected lines from a single test frame of the received data.

Thus, the signature is formed after receipt of the test frame during broadcast, and not as a part of any type of encoding. In contrast, utilization of the hashing algorithm to produce the signature in Appellant's recited invention occurs by a program source during encoding. Further, while Iggulden utilizes a single test frame to produce a signature for the received signal, Appellant fails to see any teaching or suggestion that each frame has a signature that is generated utilizing a hashing algorithm, as recited in Appellant's invention. Therefore, Appellant respectfully submits that by not including a signature produced with a hashing algorithm in every frame, and by not producing the signature with a hashing algorithm during the encoding of the video material, Iggulden fails to teach or suggest the recited hashing algorithm used to generate a signature in every frame of digital video material.

Additionally, Iggulden does not teach or suggest that a hash code signature is needed for digital television signals. Rather, Iggulden states that "if the television signal is digital, ... the signature is simply based on selected bits within one or more selected digital frames." (col. 19, lines 12-14) Thus, there is nothing from Iggulden to teach or suggest that digital video material utilizes a signature in every frame produced with a hash code algorithm during encoding of the digital video material.

In response, the Examiner states:

> **[A]pplicant argues that Iggulden fails to teach or suggest using a hashing algorithm to produce a signature in each frame. It is Copriviza who teaches adding a signature to each frame (col. 8, lines 26-39). Iggulden teaches generating signatures using hash codes, which has the inherent and well known benefit of high speed locating of representative data objects when hash codes are used. It is the combination of Copriviza and Iggulden which meets the limitation of using a hashing algorithm to produce a signature in each frame.**

Appellant respectfully disagrees that the combination of Copriviza and Iggulden meets the limitation of using a hashing algorithm to produce a signature in each frame.

In addition to the deficiencies of Iggulden, Copriviza discloses in col. 8, lines 26-40, the encoding of a video tape of program material with a "predetermined unique and non-repeating sequence" as a means of individually and uniquely identifying each and every frame of the video program material. Copriviza further discloses in col. 15, lines 50-64, that in a

> **preferred embodiment each frame is numbered successively. ... It will be appreciated that the consecutive frame numbering system ... is merely one of many sequential frame number systems that may be used to identify each and every frame individually and uniquely. For example, succeeding frames in the program may be numbered in any predetermined sequence as long as the decoders in the field receivers 36 are programmed to recognize this sequence as being the normal sequence of a program which is received without interruption.**

Copriviza clearly uses a numbering sequence in order to provide the unique identification of successive frames. As such, while the number in each frame will vary, it has context relative to preceding and successive frames based on the numbering sequence used. It is this context that is utilized in Copriviza to determine whether a frame sequence discontinuity (FSD) packet needs to be generated: (col. 15, lines 44-49) "An FSD packet is generated ... when successive frames are not in the proper sequence in which data is encoded..." Thus, without such use of a numbering sequence to provide context, the manner of producing the FSD packets is compromised, and the system of Copriviza is fundamentally altered.

The Examiner asserts in the Advisory Action dated 10/6/04 that "Copriviza clearly teaches adding signature information which uniquely identifies each individual frame of video, but does no [sic] rely exclusively on a numbering sequence for said identification, thus the inclusion of a hashing function to generate said information is a rational and feasible option." Appellant respectfully disagrees. In fact, in each of the quotes from Copriviza included by the Examiner in the Advisory Action, there is reference by Copriviza to a "predetemined unique and non-repeating sequence", that "each encoded frame is numbered

successively", and that "the consecutive frame numbering system ... is merely one of many sequential number systems that may be used to identify each and every frame individually and uniquely." As demonstrated by these quotes, Copriviza clearly teaches that unique and individual frame identification occurs by using a sequential number system.

Appellant fails to see how the use of a sequential number system to identify successive frames in a program from Copriviza can be combined with the disclosure of a hash code signature utilizing a single test frame in Iggulden, since there is nothing to teach or suggest that a hash code signature from a single test frame could or would be used to provide a predetermined unique and non-repeating sequence (i.e., a sequential number system), as required by the identifier signature of every frame in Copriviza.

Accordingly, Appellant respectfully submits that Copriviza in view of Echeita, and further in view of Iggulden fails teach, show, or suggest use of a hashing algorithm to produce the signature for each frame in the digital video material and/or during encoding of the digital video material, as recited by the Appellant.

In addition, Appellant respectfully submits that even the inclusion of Goodman is insufficient to overcome the deficiencies of Copriviza in view of Echeita and further in view of Iggulden. Therefore, Appellant respectfully requests withdrawal of the rejection against claims 4-11.

In view of the foregoing, Appellant respectfully submits that claims 4-11 are not taught, shown, or suggested by the cited art.

Accordingly, Appellant respectfully requests withdrawal of the rejection under 35 U.S.C. 103(a) and respectfully requests that the Board reverse the final rejection of Claims 4-11.

D. Rejection of Claim 17 under 35 U.S.C. 103(a) over Copriviza in view of Echeita and Iggulden and further in view of Caporizzo

In the present invention, automated monitoring of quality of service of digital video material being distributed and played occurs. A system for automated monitoring includes a program source of viewing program data, the program source embedding a signature in each frame of digital video material within the viewing program data by utilizing a hashing algorithm to produce the signature for each frame in the digital video material during encoding of the digital video material, a play-out device for receiving the viewing program data and computing play-out statistics for the digital video material based on the signature, and a display device coupled to the play-out device for displaying video output of the viewing program data from the play-out device. The play-out device further comprises a set-top cable box.

In making the rejection, the Examiner cites Copriviza for disclosing the recited embedding of a signature in each frame of video material and computing play-out statistics based on the signature but admits that Copriviza fails to disclose that the video material is digital. Echeita is cited for teaching a method for monitoring quality of service of digital video for combination with Copriviza. Both Copriviza and Echieta are admitted by the Examiner as failing to disclose utilizing a hashing algorithm to produce the signature. Thus, the Examiner cites Iggulden for combination with Copriviza and Echeita, and states, "Iggulden discloses utilizing a hashing algorithm to produce a signature for each frame in a video material (col. 6, lines 25-36), allowing the material to be quickly identified in real time."

In the cited section of col. 6, lines 25-36 of Iggulden, Iggulden merely mentions that a signature being detected from a segment of a television broadcast "may, for example, be a binary hash code." Appellant respectfully submits that Iggulden fails to teach, show, or

suggest that a hashing algorithm is utilized to produce the signature for each frame in the digital video material and/or during encoding of the digital video material, as recited in the independent claims. Referring to Figures 8, 9, 10, and 11 of Iggulden and their discussion (col. 15, line 29+), the 'signature' is Iggulden is taught as being 'read' after receipt of the television broadcast signal and upon detection of an event marker in the television signal. The 'reading' of the signature actually involves producing a bit string based on luminance levels of selected lines from a single test frame of the received data.

Thus, the signature is formed after receipt of the test frame during broadcast, and not as a part of any type of encoding. In contrast, utilization of the hashing algorithm to produce the signature in Appellant's recited invention occurs by a program source during encoding. Further, while Iggulden utilizes a single test frame to produce a signature for the received signal, Appellant fails to see any teaching or suggestion that each frame has a signature that is generated utilizing a hashing algorithm, as recited in Appellant's invention. Therefore, Appellant respectfully submits that by not including a signature produced with a hashing algorithm in every frame, and by not producing the signature with a hashing algorithm during the encoding of the video material, Iggulden fails to teach or suggest the recited hashing algorithm used to generate a signature in every frame of digital video material.

Additionally, Iggulden does not teach or suggest that a hash code signature is needed for digital television signals. Rather, Iggulden states that "if the television signal is digital, ... the signature is simply based on selected bits within one or more selected digital frames." (col. 19, lines 12-14) Thus, there is nothing from Iggulden to teach or suggest that digital video material utilizes a signature in every frame produced with a hash code algorithm during encoding of the digital video material.

In response, the Examiner states:

> **[A]pplicant argues that Iggulden fails to teach or suggest using a hashing algorithm to produce a signature in each frame. It is Copriviza who teaches adding a signature to each frame (col. 8, lines 26-39). Iggulden teaches generating signatures using hash codes, which has the inherent and well known benefit of high speed locating of representative data objects when hash codes are used. It is the combination of Copriviza and Iggulden which meets the limitation of using a hashing algorithm to produce a signature in each frame.**

Appellant respectfully disagrees that the combination of Copriviza and Iggulden meets the limitation of using a hashing algorithm to produce a signature in each frame.

In addition to the deficiencies of Iggulden, Copriviza discloses in col. 8, lines 26-40, the encoding of a video tape of program material with a "predetermined unique and non-repeating sequence" as a means of individually and uniquely identifying each and every frame of the video program material. Copriviza further discloses in col. 15, lines 50-64, that in a

> **preferred embodiment each frame is numbered successively. ... It will be appreciated that the consecutive frame numbering system ... is merely one of many sequential frame number systems that may be used to identify each and every frame individually and uniquely. For example, succeeding frames in the program may be numbered in any predetermined sequence as long as the decoders in the field receivers 36 are programmed to recognize this sequence as being the normal sequence of a program which is received without interruption.**

Copriviza clearly uses a numbering sequence in order to provide the unique identification of successive frames. As such, while the number in each frame will vary, it has context relative to preceding and successive frames based on the numbering sequence used. It is this context that is utilized in Copriviza to determine whether a frame sequence discontinuity (FSD) packet needs to be generated: (col. 15, lines 44-49) "An FSD packet is generated ... when successive frames are not in the proper sequence in which data is encoded..." Thus, without such use of a numbering sequence to provide context, the manner of producing the FSD packets is compromised, and the system of Copriviza is fundamentally altered.

The Examiner asserts in the Advisory Action dated 10/6/04 that "Copriviza clearly teaches adding signature information which uniquely identifies each individual frame of video, but does no [sic] rely exclusively on a numbering sequence for said identification, thus the inclusion of a hashing function to generate said information is a rational and feasible option." Appellant respectfully disagrees. In fact, in each of the quotes from Copriviza included by the Examiner in the Advisory Action, there is reference by Copriviza to a "predetemined unique and non-repeating sequence", that "each encoded frame is numbered successively", and that "the consecutive frame numbering system ... is merely one of many sequential number systems that may be used to identify each and every frame individually and uniquely." As demonstrated by these quotes, Copriviza clearly teaches that unique and individual frame identification occurs by using a sequential number system.

Appellant fails to see how the use of a sequential number system to identify successive frames in a program from Copriviza can be combined with the disclosure of a hash code signature utilizing a single test frame in Iggulden, since there is nothing to teach or suggest that a hash code signature from a single test frame could or would be used to provide a predetermined unique and non-repeating sequence (i.e., a sequential number system), as required by the identifier signature of every frame in Copriviza.

Accordingly, Appellant respectfully submits that Copriviza in view of Echeita, and further in view of Iggulden fails teach, show, or suggest use of a hashing algorithm to produce the signature for each frame in the digital video material and/or during encoding of the digital video material, as recited by the Appellant.

In addition, Appellant respectfully submits that even the inclusion of Caporizzo is insufficient to overcome the deficiencies of Copriviza in view of Echeita and further in

view of Iggulden. Therefore, Appellant respectfully requests withdrawal of the rejection against claim 17.

In view of the foregoing, Appellant respectfully submits that claim 17 is not taught, shown, or suggested by the cited art.

Accordingly, Appellant respectfully requests withdrawal of the rejection under 35 U.S.C. 103(a) and respectfully requests that the Board reverse the final rejection of Claim 17.

E. Rejection of Claim 18 under 35 U.S.C. 103(a) over Copriviza in view of Echeita and Iggulden and further in view of Goodman

In the present invention, automated monitoring of quality of service of digital video material being distributed and played occurs. A system for automated monitoring includes a program source of viewing program data, the program source embedding a signature in each frame of digital video material within the viewing program data by utilizing a hashing algorithm to produce the signature for each frame in the digital video material during encoding of the digital video material, a play-out device for receiving the viewing program data and computing play-out statistics for the digital video material based on the signature, and a display device coupled to the play-out device for displaying video output of the viewing program data from the play-out device. The play-out device further comprises a play-out device within a cable head-end.

In making the rejection, the Examiner cites Copriviza for disclosing the recited embedding of a signature in each frame of video material and computing play-out statistics based on the signature but admits that Copriviza fails to disclose that the video material is

digital. Echeita is cited for teaching a method for monitoring quality of service of digital video for combination with Copriviza. Both Copriviza and Echieta are admitted by the Examiner as failing to disclose utilizing a hashing algorithm to produce the signature. Thus, the Examiner cites Iggulden for combination with Copriviza and Echeita, and states, "Iggulden discloses utilizing a hashing algorithm to produce a signature for each frame in a video material (col. 6, lines 25-36), allowing the material to be quickly identified in real time."

In the cited section of col. 6, lines 25-36 of Iggulden, Iggulden merely mentions that a signature being detected from a segment of a television broadcast "may, for example, be a binary hash code." Appellant respectfully submits that Iggulden fails to teach, show, or suggest that a hashing algorithm is utilized to produce the signature for each frame in the digital video material and/or during encoding of the digital video material, as recited in the independent claims. Referring to Figures 8, 9, 10, and 11 of Iggulden and their discussion (col. 15, line 29+), the 'signature' is Iggulden is taught as being 'read' after receipt of the television broadcast signal and upon detection of an event marker in the television signal. The 'reading' of the signature actually involves producing a bit string based on luminance levels of selected lines from a single test frame of the received data.

Thus, the signature is formed after receipt of the test frame during broadcast, and not as a part of any type of encoding. In contrast, utilization of the hashing algorithm to produce the signature in Appellant's recited invention occurs by a program source during encoding. Further, while Iggulden utilizes a single test frame to produce a signature for the received signal, Appellant fails to see any teaching or suggestion that each frame has a signature that is generated utilizing a hashing algorithm, as recited in Appellant's invention. Therefore, Appellant respectfully submits that by not including a signature produced with a hashing

algorithm in every frame, and by not producing the signature with a hashing algorithm during the encoding of the video material, Iggulden fails to teach or suggest the recited hashing algorithm used to generate a signature in every frame of digital video material.

Additionally, Iggulden does not teach or suggest that a hash code signature is needed for digital television signals. Rather, Iggulden states that "if the television signal is digital, ... the signature is simply based on selected bits within one or more selected digital frames." (col. 19, lines 12-14) Thus, there is nothing from Iggulden to teach or suggest that digital video material utilizes a signature in every frame produced with a hash code algorithm during encoding of the digital video material.

In response, the Examiner states:

> **[A]pplicant argues that Iggulden fails to teach or suggest using a hashing algorithm to produce a signature in each frame. It is Copriviza who teaches adding a signature to each frame (col. 8, lines 26-39). Iggulden teaches generating signatures using hash codes, which has the inherent and well known benefit of high speed locating of representative data objects when hash codes are used. It is the combination of Copriviza and Iggulden which meets the limitation of using a hashing algorithm to produce a signature in each frame.**

Appellant respectfully disagrees that the combination of Copriviza and Iggulden meets the limitation of using a hashing algorithm to produce a signature in each frame.

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> **preferred embodiment each frame is numbered successively. ... It will be appreciated that the consecutive frame numbering system ... is merely one of many sequential frame number systems that may be used to identify each and every frame individually and uniquely. For example, succeeding frames in the program may be numbered in any predetermined sequence as long as the decoders in the field receivers 36 are programmed to recognize**

this sequence as being the normal sequence of a program which is received without interruption.

Copriviza clearly uses a numbering sequence in order to provide the unique identification of successive frames. As such, while the number in each frame will vary, it has context relative to preceding and successive frames based on the numbering sequence used. It is this context that is utilized in Copriviza to determine whether a frame sequence discontinuity (FSD) packet needs to be generated: (col. 15, lines 44-49) "An FSD packet is generated ... when successive frames are not in the proper sequence in which data is encoded..." Thus, without such use of a numbering sequence to provide context, the manner of producing the FSD packets is compromised, and the system of Copriviza is fundamentally altered.

The Examiner asserts in the Advisory Action dated 10/6/04 that "Copriviza clearly teaches adding signature information which uniquely identifies each individual frame of video, but does no [sic] rely exclusively on a numbering sequence for said identification, thus the inclusion of a hashing function to generate said information is a rational and feasible option." Appellant respectfully disagrees. In fact, in each of the quotes from Copriviza included by the Examiner in the Advisory Action, there is reference by Copriviza to a "predetemined unique and non-repeating sequence", that "each encoded frame is numbered successively", and that "the consecutive frame numbering system ... is merely one of many sequential number systems that may be used to identify each and every frame individually and uniquely." As demonstrated by these quotes, Copriviza clearly teaches that unique and individual frame identification occurs by using a sequential number system.

Appellant fails to see how the use of a sequential number system to identify successive frames in a program from Copriviza can be combined with the disclosure of a hash code signature utilizing a single test frame in Iggulden, since there is nothing to teach or suggest

that a hash code signature from a single test frame could or would be used to provide a predetermined unique and non-repeating sequence (i.e., a sequential number system), as required by the identifier signature of every frame in Copriviza.

Accordingly, Appellant respectfully submits that Copriviza in view of Echeita, and further in view of Iggulden fails teach, show, or suggest use of a hashing algorithm to produce the signature for each frame in the digital video material and/or during encoding of the digital video material, as recited by the Appellant.

In addition, Appellant respectfully submits that even the inclusion of Goodman is insufficient to overcome the deficiencies of Copriviza in view of Echeita and further in view of Iggulden. Therefore, Appellant respectfully requests withdrawal of the rejection against claim 18.

In view of the foregoing, Appellant respectfully submits that claim 18 is not taught, shown, or suggested by the cited art.

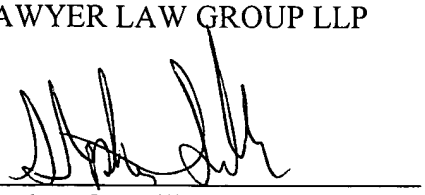
Accordingly, Appellant respectfully requests withdrawal of the rejection under 35 U.S.C. 103(a) and respectfully requests that the Board reverse the final rejection of Claim 18.

For all the foregoing reasons, it is respectfully submitted that Claims 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 26, 27, 28, and 29 (all the Claims presently in the application) are patentable for defining subject matter which would not have been unpatentable under 35 U.S.C. § 103(a). Thus, Appellant respectfully requests that the Board reverse the rejection of all the appealed Claims and find each of these Claims allowable.

Authorization for payment of the required Brief fee is contained in the transmittal letter for this Brief. Please charge any fee that may be necessary for the continued pendency of this application to Deposit Account No.

Respectfully submitted,

SAWYER LAW GROUP LLP



March 24, 2005
Date

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VIII. APPENDIX

2. A method for automated monitoring of quality of service of digital video material being distributed and played, the method comprising:

embedding a signature in each frame of the digital video material by a program source device control by utilizing a hashing algorithm to produce the signature for each frame in the digital video material during encoding of the digital video material; and

computing play-out statistics for the digital video material based on the signature by a program play-out device control.

3. The method of claim 2 further comprising providing a key identifier in a header of the signature and identifying inclusion of the signature based on the key identifier.

4. The method of claim 2 wherein embedding further comprises creating a meta-stream for the digital video material and encrypting the meta-stream.

5. The method of claim 4 wherein the meta-stream further comprises a header session.

6. The method of claim 5 wherein the header session further comprises an identifier, a length, and a time of play-out of the digital video material.

7. The method of claim 4 wherein the step of computing statistics further comprises capturing the meta-stream and computing the signature for an incoming stream of digital video material.

8. The method of claim 7 further comprising utilizing the signature of the meta-stream to trigger comparison with the computed signature of the incoming stream of digital video material.

9. The method of claim 8 further comprising computing a number of frames having a matching signature to the computed signature, identifying a time of play-out for the video stream, and determining a duration of the digital video material played-out.

10. The method of claim 9 further comprising storing the play-out statistics on a local storage device for the play-out device control.

11. The method of claim 10 further comprising transmitting the play-out statistics back for the program source device control for quality of service measurements.

12. The method of claim 2 wherein the digital video material further comprises a digital advertisement.

13. A system for automated monitoring of quality of service of digital video material being distributed and played, the system comprising:

a program source of viewing program data, the program source embedding a signature in each frame of digital video material within the viewing program data by utilizing a hashing algorithm to produce the signature for each frame in the digital video material during encoding of the digital video material;

a play-out device for receiving the viewing program data and computing play-out statistics for the digital video material based on the signature; and

a display device coupled to the play-out device for displaying video output of the viewing program data from the play-out device.

14. The system of claim 13 wherein the viewing program data further comprises a cable station program feed.

15. The system of claim 13 wherein the viewing program data further comprises a satellite program feed.

16. The system of claim 13 wherein the viewing program data further comprises an air wave program feed.

17. The system of claim 13 wherein the play-out device further comprises a set-top cable box.

18. The system of claim 13 wherein the play-out device further comprises a play-out device within a cable head-end.

19. The system of claim 13 wherein the play-out device further comprises a computer.

20. The system of claim 13 wherein the digital video material further comprises a digital advertisement.

21. The system of claim 13 wherein the program source further provides the signature in a meta-stream, the meta-stream including an identifier for the digital video material, a length of the digital video material, and a time for play-out of the digital video material.

22. The system of claim 21 wherein the play-out device further computes play-out statistics by capturing the meta-stream, computing a signature for the digital video material, and comparing the computed signature to the provided signature.

23. The system of claim 22 wherein the video play-out device further computes statistics by computing a number of frames in the digital video material having a match condition with the signature, identifying a time of play-out of the digital video material, and determining a duration of the digital video material actually played-out.

24. The system of claim 23 wherein the video play-out device stores the play-out statistics in a local storage and transmits the play-out statistics to the program source, wherein the program source measures quality of service for the digital video material from automated analysis of the play-out statistics.

26. A method for achieving automated monitoring of quality of service of digital video material play-out in a video distribution and display system, the method comprising:

embedding video source material at a program source with hidden data and a meta-stream for uniquely marking a digital advertisement with the video source material, wherein the hidden data further comprises a signature generated by a hashing algorithm for each frame of the digital advertisement;

isolating the meta-stream and the digital advertisement from the video source material in a program play-out device; and

utilizing the meta-stream in the program play-out device to determine play-out statistics for the digital advertisement.

27. The method of claim 26 wherein the meta-stream further includes an identifier for the digital advertisement, a number of frames of the digital advertisement, and a time for play-out of the digital advertisement.

28. The method of claim 27 wherein the play-out statistics further comprise a start-time of play-out, a number of frames in the digital advertisement correctly decoded, and an end-time of play-out of the digital advertisement.

29. The method of claim 28 further comprising providing the play-out statistics to the program source, and analyzing the play-out statistics to determine quality of digital advertisement display.

IX. EVIDENCE APPENDIX

N/A

X. RELATED PROCEEDINGS APPENDIX

N/A